What is claimed is:

1. An apparatus for treating gas prior to the use of the gas in a medical procedure involving a patient, the gas being received into the apparatus from an insufflator which receives gas from a gas source, and the gas exiting the apparatus being in flow communication with a means for delivering the gas to the interior of the patient, wherein the gas is pressure-and volumetric flow rate-controlled by the insufflator, the apparatus comprising:

a) a housing defining a chamber having an entry port and an exit port, the exit port adapted to be in flow communication with the means for delivering and the inlet adapted to be in flow communication with the outlet of the insufflator; and

c) humidification means disposed within the chamber in the path of travel of the gas through the chamber for humidifying the gas as it travels through the chamber.

2. The apparatus of claim 1, wherein the humidification means is a subchamber within the chamber that contains a volume of liquid in flow communication with the gas as it passes through the chamber.

3. The apparatus of claim 2, wherein the humidification means comprises at least one layer of liquid-retaining material capable of retaining a volume of liquid.

4. The apparatus of claim 3, wherein the at least one layer of liquid-retaining material is pre-charged with the volume of liquid.

5. The apparatus of claim 4, wherein the at least one layer of liquid-retaining material is rechargeable with liquid.

6. The apparatus of claim 1, wherein the humidification means comprises a plurality of water-retaining layers.

7. The apparatus of claim 1, and further comprising a backup container for liquid and an access tube that couples to the housing to provide a supply of liquid to the humidification means.

8. The apparatus of claim 7, wherein the backup container hangs free of the housing.

9. The apparatus of claim 7, wherein the backup container is fastened to the apparatus.

10. The apparatus of claim 9, wherein the backup container is fastened to a tube segment leading from the insufflator to the entry port of the housing.

11. The apparatus of claim 7, and further comprising an extension tube that couples the access tube to the humidification means.

12. The apparatus of claim 1, and further comprising humidity sensing means disposed within the chamber for sensing the humidity of gas as it exits the chamber; and monitoring means connected to the humidity sensing means for monitoring the humidity of the gas as it exits the chamber.

13. The apparatus of claim 12, wherein the monitoring means detects when the humidification means requires recharging of liquid and generates a recharge signal indicative thereof.

14. The apparatus of claim 13, and further comprising alarm means responsive to the recharge signal to generate an alarm suitable for alerting a user that the humidification means requires recharging.

15. The apparatus of claim 14, wherein the alarm means is an audible alarm and/or visual alarm.

16. The apparatus of claim 14, and further comprising a charging port on the housing to permit recharging of the humidification means with liquid.

17. The apparatus of claim 16, wherein the charging port comprises a member that permits the introduction of liquid into the chamber.

18. The apparatus of claim 17, wherein the member is a resealable member.

19. The apparatus of claim 12, wherein the monitoring means determines when the relative humidity of gas in the chamber drops below a relative humidity threshold and generates the recharge signal in response thereto.

20. The apparatus of claim 19, wherein the monitoring means determines when the relative humidity of gas drops below a critical relative humidity threshold which is lower than the relative humidity threshold and generates a warning signal in response thereto.

21. The apparatus of claim 12, wherein the humidity sensing means is positioned in the chamber in the flow path of the gas proximate the exit port of the housing.

22. The apparatus of claim 21, wherein the humidity sensing means is a humidity sensitive capacitor.

23. The apparatus of claim 21, wherein the humidity sensing means is a humidity sensitive resistor.

24. The apparatus of claim 1, wherein the housing is for connection to the means for delivering so as to be immediately adjacent the patient.

25. The apparatus of claim 1, and further comprising:

heating means disposed within the chamber for heating the gas; and

temperature sensing means disposed within the chamber for sensing the temperature of the gas in the chamber; and

control means connected to the temperature sensing means and to the heating means and responsive to the temperature sensing means to control electrical power to the heating means so as to regulate the amount of heat applied by the heating means to the gas within the chamber, thereby maintaining the gas at a desired temperature or within a desired temperature range.

26. The apparatus of claim 25, wherein the control means is responsive to the monitoring means determining when the relative humidity of gas drops below a critical relative humidity threshold to terminate electrical power to the heating means.

27. The apparatus of claim 25, wherein the heating means is disposed within the chamber substantially co-located with the humidification means so that the gas is substantially simultaneously heated and hydrated.

28. The apparatus of claim 25, wherein the heating means comprises an electrical resistive wire.

29. The apparatus of claim 28, wherein the electrical resistive wire is arranged in a concentrically coil configuration within the housing.

30. The apparatus of claim 1, and further comprising filter means connected to the means for communicating upstream from the housing for filtering the gas exiting the insufflator.

31. The apparatus of claim 1, and further comprising an AC/DC converter connected to the monitoring means and suitable for connection to a standard AC power supply, and which generates a DC voltage suitable for powering the monitoring means.

32. The apparatus of claim 1, and further comprising a battery for supplying a DC voltage suitable for powering the monitoring means.

33. The apparatus of claim 12, wherein the monitoring means is contained within an electrical housing and is connected to the humidification means and to the humidity sensing means by an insulated electrical cable.

34. The apparatus of claim 33, and further comprising a removable electrical connector that terminates one end of the insulated electrical cable and connects to a receptacle in the electrical housing.

35. The apparatus of claim 12, wherein the monitoring means comprises:

an oscillator circuit connected to the humidity sensing means, wherein the oscillator circuit generates an output signal with a frequency dependent on a capacitance of the humidity sensing means; and

a microcontroller connected to the oscillator circuit that measures a characteristic of the output signal of the oscillator circuit to determine a measure of the relative humidity of the gas exiting the chamber.

36. The apparatus of claim 35, wherein the output signal generated by the oscillator circuit is a square wave, and wherein the microcontroller measures a width of a phase of the output signal to determine a measure of the relative humidity of the gas exiting the chamber.

37. The apparatus of claim 35, and further comprising:

heating means disposed within the chamber for heating the gas; and

temperature sensing means disposed within the chamber for sensing the temperature of the gas in the chamber; and

an operational amplifier connected to the temperature sensing means to generate as output a signal representing the temperature of the gas exiting the chamber;

an analog-to-digital converter connected to the operational amplifier to convert the signal output by the operational amplifier to a digital word representing the temperature of the gas;

wherein the microcontroller is connected to the analog-to-digital converter and is responsive to the digital word output by the analog-to-digital converter to control electrical power to the heating means so as to regulate the amount of heat applied by the heating means to the gas within the chamber, thereby maintaining the gas at a desired temperature.

38. The apparatus of claim 12, wherein the monitoring means is responsive to a signal representing a resistance of the humidity sensing means.

39. A method of, for any selected period of time, conditioning gas for delivery into a patient for a medical procedure comprising the steps of:

a) directing a gas from a gas source into a chamber; and

b) humidifying the gas within the chamber with a volume of liquid.

40. The method of claim 39, and further comprising steps of:

c) sensing the humidity of the gas as it exits the chamber; and

d) monitoring the humidity of the gas exiting the chamber.

41. The method of claim 40, wherein the step of monitoring comprises determining when the volume of liquid in the chamber requires replenishing based on the humidity of the gas in the chamber.

42. The method of claim 40, wherein the step of monitoring comprises determining when the relative humidity of the gas in the chamber drops below a relative humidity threshold.

43. The method of claim 40, and further comprising the step of generating an alarm when it is determined that the volume of liquid in the chamber requires replenishing.

44. The method of claim 43, and further comprising the step of recharging the chamber with liquid in response to the alarm.

45. The method of claim 43, wherein the alarm is continued until it is determined that the chamber has been replenished with liquid based on the humidity of the gas in the chamber.

46. The method of claim 38, and further comprising the step of generating an alarm when it is determined that the humidity of the gas in the chamber drops below a critical relative humidity threshold.

47. The method of claim 39, and further comprising the step of providing a continuous backup supply of liquid to the chamber.

48. The method of claim 39, and further comprising step of heating the gas within the chamber.

49. The method of claim 48, and further comprising the steps of

sensing the temperature of the gas as it exits the chamber; and

controlling electrical power to the heating element so as to regulate the temperature of the gas as it exits the chamber.

50. The method of claim 49, and further comprising the step of terminating electrical power to the heating element when it is determined that the humidity of the gas in the chamber drops below a critical relative humidity threshold.

51. The method of claim 48, wherein the step of humidifying and the step of heating are performed on the gas substantially simultaneously within the chamber.

52. The method of claim 51, wherein the step of sensing the humidity and sensing the temperature are performed in the flow path of the gas downstream from the steps of heating and humidifying in the chamber.

53. The method of claim 39, and further comprising the step of positioning the chamber immediately adjacent the patient.

54. The method of claim 39, and further comprising the step of filtering the gas prior to the step of humidifying.

55. An apparatus for conditioning gas for use in a medical procedure involving a patient, the gas being received into the apparatus from a gas source, the apparatus comprising:

a) a housing defining a chamber having an entry port and an exit port, the entry port adapted to be in flow communication with the gas source and the exit port delivering conditioned gas therefrom; and

b) a container for liquid disposed within the chamber in the path of travel of the gas through the chamber for humidifying the gas as it travels through the chamber.

56. The apparatus of claim 55, wherein the container comprises at least one layer of liquid-retaining material.

57. The apparatus of claim 55, and further comprising a humidity sensor disposed within the chamber for sensing the humidity of gas as it exits the chamber; and a monitoring circuit connected to the humidity sensor for monitoring the humidity of the gas exiting the chamber.

58. The apparatus of claim 57, wherein the humidity sensor is a humidity sensitive capacitor.

59. The apparatus of claim 57, wherein the humidity sensor is a humidity sensitive resistor.

60. The apparatus of claim 57, wherein the monitoring circuit determines that the container in the housing requires recharging of liquid when the humidity of the gas in the chamber drops below a relative humidity threshold.

61. The apparatus of claim 60, and further comprising an alarm connected to the monitoring circuit and responsive to a recharge signal generated by the monitoring circuit to generate an alarm suitable for alerting a user that the container in the housing requires recharging.

62. The apparatus of claim 55, and further comprising a charging port on the housing to permit recharging of the container with liquid.

63. The apparatus of claim 55, wherein the container is pre-charged with a volume of liquid.

64. The apparatus of claim 55, wherein the container is rechargeable with a liquid.

65. The apparatus of claim 55, and further comprising a backup container for liquid and an access tube that couples to the housing to provide a supply of liquid to the container.

66. The apparatus of claim 65, wherein the backup container hangs free of the housing.

67. The apparatus of claim 65, wherein the backup container is fastened to the apparatus.

68. The apparatus of claim 65, wherein the backup container is fastened to a tube segment leading from the insufflator to the entry port of the housing.

69. The apparatus of claim 65, and further comprising an extension tube that couples the access tube to the container in the housing.

70. The apparatus of claim 55, and further comprising a heating element disposed in the chamber for heating gas as it passes through the chamber.

71. The apparatus of claim 70, and further comprising:

a temperature sensor disposed in the chamber to sense the temperature of the gas as it exits the chamber; and

a control circuit connected to the temperature sensor and to the heating element, and responsive to the temperature sensor to control electrical power to the heating element so as to regulate the amount of heat applied by the heating element to the gas within the chamber, thereby maintaining the gas at a desired temperature or within a desired temperature range.

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